

### **Abstract**

An actuator includes a coil and an IC attached to a core. The coil produces a magnetic field and the core provides a path for the magnetic field. A rotor is rotatably mounted within the core, so that the rotor rotates in response to the magnetic field produced by the coil. The IC is electrically connected to the coil. The distance between the IC and the coil is determined based on a permissible temperature of the IC, so that the IC is not heated substantially in excess of the permissible temperature.